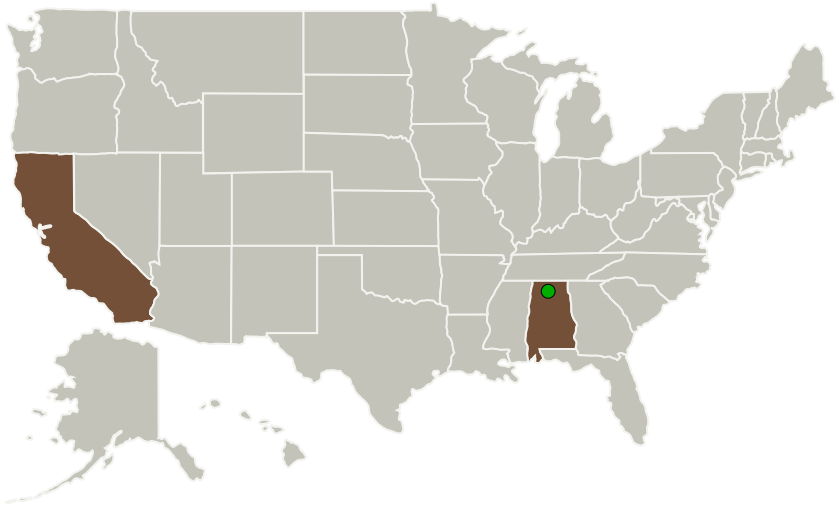
Affordable, Ultra-stable CVC SiC UVOIR Telescope for BENI Mission, Phase I

Completed Technology Project (2013 - 2013)

Project Introduction

Working with our System Integrator partner (ITT-Exelis) and Richard Lyon (NASA/GSFC Principal Investigator Compact Achromatic Visible Nulling Coronagraph Technology Maturation) and his telescope expert Lee Feinberg, Trex will perform a preliminary design of a 1-meter aperture, ultrastable, UVOIR telescope made using Trex Chemical Vapor Composite Silicon Carbide (CVC SiC™). The highly athermal silicon carbide telescope provides an affordable solution for the Balloon Exoplanet Nulling Interferometer (BENI) Mission to qualify the VNC, with traceability to the requirements of the ATLAST observatory. Trex also proposes to demonstrate replicated, powered CVC SiC™ substrates using a new, polishable graphite mandrel material which allows the release of our CVC SiC™ deposit from the mandrel with a spectral finish. The new process eliminates rough and fine grinding of the optical surface, which is directly ready for fine lapping and polishing. The payoff will be at least a factor of 2X reduction in the areal cost of high performance CVC SiC™ mirrors, with an associated reduction in schedule on the order of 6-months. Using meniscus mirror designs for lightweighted mirrors in the telescope, rather than a web-based isogrid design, will also reduce the cost and schedule for CVC SiC™ mirrors, while not sacrificing weight or stiffness.

Primary U.S. Work Locations and Key Partners



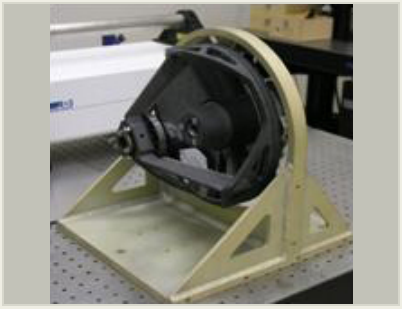


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Table of Contents

Small Business Innovation Research/Small Business Tech Transfer

Affordable, Ultra-stable CVC SiC UVOIR Telescope for BENI Mission, Phase I

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Organizations Performing Work	Role	Type	Location
Trex Enterprises Corporation	Lead Organization	Industry	San Diego, California
Marshall Space Flight Center(MSFC)	Supporting Organization	NASA Center	Huntsville, Alabama

Primary U.S. Work Locations	
Alabama	California

Project Transitions

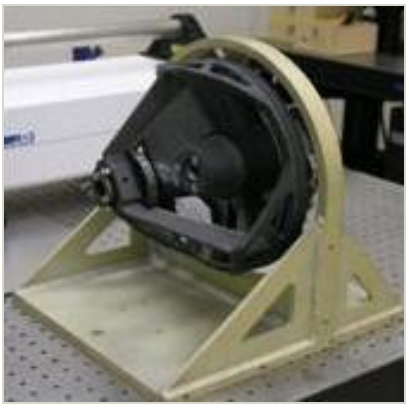
May 2013: Project Start

November 2013: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/137983)*

Images



Project Image
Affordable, Ultra-stable CVC SiC UVOIR Telescope for BENI Mission *(https://techport.nasa.gov/image/131260)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Trex Enterprises Corporation

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

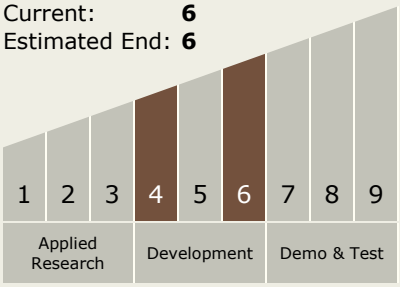
Carlos Torrez

Principal Investigator:

Bill Goodman

Technology Maturity (TRL)

Start: **4**
Current: **6**
Estimated End: **6**



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Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.2 Observatories
    - TX08.2.1 Mirror Systems

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System